# Creativity, reuse, and regularity in music and language

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Abstract

A recent strand in research in historical linguistics has argued that language change often involves constructional routinization (e.g. Traugott and Trousdale 2013), while recent psycholinguistic work has also suggested parallels between alignment, routinization and change (Garrod and Pickering 2013): such routines have been shown to emerge in conversational flow, as a product of interaction between speakers and hearers. Similar claims have been made for the development of musical routines in improvisation: much improvisational work involves the use of pre-fabricated routines (Torrance and Schumann 2018). This article seeks to contribute to the debate on creativity by providing an analysis of some of the similarities and differences between musical and linguistic conventions, including a comparison of creative improvisation in music and innovation in language. The discussion is couched in a cognitive linguistic framework, with a particular focus on linguistic constructions (see the overview in Hoffmann and Trousdale 2013), and a reflection of how this might be extended to consider aspects of the cognitive representation of musical structures.

Key words: creativity, change, interaction, routines

## 1 Introduction

A recent strand in research in historical linguistics has argued that language change often involves constructional routinization (e.g. Traugott and Trousdale 2013), while recent psycholinguistic work has also suggested parallels between alignment, routinization and change (Garrod and Pickering 2013): such routines have been shown to emerge in conversational flow, as a product of interaction between speakers and hearers. Similar claims have been made for the development of musical routines in

improvisation: much improvisational work involves the use of pre-fabricated routines (Torrance and Schumann 2018). The present article seeks to contribute to the debate on creativity by providing an analysis of some of the similarities and differences between musical and linguistic conventions, including a comparison of creative improvisation in music and innovation in language. The discussion is couched in a cognitive linguistic framework, with a particular focus on linguistic constructions (see the overview in Hoffmann and Trousdale 2013), and a reflection of how this might be extended to consider aspects of the cognitive representation of musical structures.

The article is structured as follows. Section 2 provides an overview of aspects of how (psycho)linguists have treated creativity in language, essentially from an 'on-line' perspective. The focus then shifts to consider diachrony: how does the kind of creative act that typifies the sort of linguistic interaction discussed in the first part of section 2 lead to the establishment of new conventions? Section 3 extends the discussion to musical creativity, looking at different approaches to creativity in music, and how this might be manifest in scores and recordings. The section also considers a very small case study looking at two features of a particular song, whose properties have undergone change from its first incarnation to the version that is more familiar today. This involves a short account of the establishment of musical routines and considers how these relate to routines in language. Section 4 provides a conclusion.

## 2 Perspectives on creativity in language

In this section, I consider creativity from two distinct but related points of view from within the field of linguistics. The first is essentially synchronic and psycholinguistic in orientation, while the second focuses more on diachrony and principles of language change.

### 2.1 The synchronic view

In order to contextualize work on creativity in language, it is useful to begin with some reflections on more general definitions of creativity. For instance, McPherson and Limb

(2013: 80) see creativity as "the ability to produce work that is both novel and in some way appropriate for a given context". While the production of language may not typically be considered work, in all other respects, McPherson and Limb's characterization of creativity is consistent with what we know about linguistic innovation (a creative instance of language use that is rule-changing in some way, on which see further below) and the conventionalization of such innovation (i.e. language change), since the innovation that is the source of change must be "in some way" appropriate in its initial context of use.

Both formal and functional approaches to language have been concerned with understanding the role of creativity in language structure and language use. From a usage-based perspective, Goldberg (2019: 61) draws attention to grammaticality judgements that are sometimes associated with creative language use, but recognizes that conformity must emerge from the conventionalization of creative language acts. In particular, such acts are often only minimally different from existing conventions: "a construction is strengthened, becoming more accessible, when new representations overlap with existing representations. The range of a construction is broadened when witnessed instances are more variable" (Goldberg 2019: 73).

An important observation in research on psycholinguistic approaches to creativity concerns the collaborative nature of typical linguistic interaction. In their work on dialogue, Garrod and Pickering (2013: 49) draw attention to the fact that interlocutors are essentially involved in something of a guessing game as they converse: while they may have expectations as to how a dialogue is likely to proceed, there are no guarantees. In this joint venture, conversational partners will often make use of repetition and reformulation, a consequence of which is what they refer to throughout their paper as 'interactive alignment'. This alignment has three implications for processing[1]:

(a) "parity of representations" (Garrod and Pickering 2013: 49), i.e. the sharing of a common code in which the same construction is used for both speaker (SP) and hearer (H). I will suggest later that while such parity helps to reinforce existing conventions (cf.

[1] See further Levinson (2016) on turn-taking and prediction.

the discussion of Goldberg 2019 above), it cannot be characteristic of those interactions in which innovations lead to change (i.e. the rule-changing creative acts of Chomsky 1964), where absolute parity of representations between SP and H cannot hold.

(b) alignment across levels. For example, SP and H may accommodate at the lexical level by reusing identical or closely related words; this is in turn often mirrored by (or will encourage) use of the same process at the level of grammatical constructions. Similarly, if one adopts a constructional approach to language, alignment may occur across the form-meaning divide in the construction, such that, for example, semantic associations encourage syntactic associations.

(c) automaticity. Automaticity involves the entrenchment of interactive routines. These are perhaps most salient at the beginning and end of a dialogue (i.e. in cases of phatic communion), but may also be attested in terms of participants' behaviour with regard to turn-taking and overlap, for instance.

Such interactive alignment may be short-term or long-term. The former is said to be achieved via priming, and the latter via routinization (Garrod and Pickering 2013). In the following section, I explore the relationship between neoanaylsis (as a kind of 'immediate' alignment) and routinization (which emerges over a longer period).

It should be noted that Garrod and Pickering (2013: 61) also make reference to language change, but they do not make quite the same associations. What they do say, however, is consistent with the construction-based approach to language change that is described in Traugott and Trousdale (2013). Both accounts focus on the importance of lifelong learning, in particular the idea that language change is not restricted to a critical period of acquisition. Garrod and Pickering stress that "the evolutionary process arises from usage rather than constraints on learning, because the linkage is through interactive alignment and routinization" (Garrod and Pickering 2013: 61), while Traugott and Trousdale (2013) similarly subscribe to the basic principle of usage-based linguistics, namely that language structure is largely emergent across patterns of language use. Thus it is clear that there is a parallel between the psycholinguistic approach to

creativity, innovation and change identified by Garrod and Pickering (2013) and the historical linguistic approach to the same phenomena as outlined by Traugott and Trousdale (2013). This latter approach is explored in greater detail in the following section.

## 2.2 The diachronic view

The creativity that leads to language change follows is the second type of creativity that Chomsky (1964) referred to, i.e. rule-changing creativity. In Black's terms, "[f]or all its fixity of structure at any given time, a living language has an **inherent plasticity** and capacity for growth and adaptation" (Black 1968: 65, emphasis added). Plasticity is consistent with all linguistic theories, but is perhaps foregrounded most in a usage-based framework such as Cognitive Construction Grammar (e.g. Goldberg 2019), in which knowledge of language is understood as knowledge of constructions, represented as a network of form-meaning pairings (the constructicon). While this plasticity is a property of individual representations of language, it emerges as a product of interaction between speakers (SP) and hearers (H).[2]

As a result of this interactivity, language users change the representations that are stored as part of their knowledge of language, i.e. components of the constructicon may be newly analysed. Traugott and Trousdale (2019) argue that, from a usage-based perspective, 'analysis' must be something that both SP and H (or writer (W) and reader (R)) engage in in every communicative act. In interaction, every act of analysis is the attempt on the part of the SP and H to use the component parts of linguistic system (the constructions) to engage in some aspect of social interaction (for instance, to pass on information, or to establish a social bond, etc.). But in such analysis there may be a match between the token created and the stored constructional type (in Langacker's terms, the token is fully sanctioned by an existing category structure (Langacker 1987)), in which case there is no innovation.

[2] Note in this regard Garrod and Pickering's position which rather blurs the distinction between SP and H: successful dialogue requires the SP to be listening as she talks, and the H preparing to speak as he listens (Garrod and Pickering 2013)

At other times, a new analysis may arise. Such neoanalysis involves some alteration to either the form or meaning pole of a construction, and/or the creation of a new symbolic link between form and meaning, on the part of the individual language user. Neoanalysis occurs when the SP or H first produces or perceives (respectively) a form which is not conventionally linked to a particular discourse-function, but may be unconventionally linked to that function given the pragmatic context of the speech act. This may be parallel to Langacker's partial sanction, which Croft and Cruse (2004: 55) describe as "a more creative extension of the category to the current situation." This suggests, however, that the creativity involved involves extension of an existing category, rather than the creation of a new category itself. The key issue is that the individual's innovation (which may lead to community change) starts with specific usage-events. Furthermore, while it is possible for the SP or H to create a neoanalysis consciously or deliberately, this is rare in language. It is sometimes more frequently attested in particular genres, such as advertising. For instance, in the early 1970s, the 7-UP soft drink company marketed their product as the *uncola*. This neologism was a conscious act on the part of the J. Walter Thompson advertising agency to come up which a noun for the product that set it in opposition to other leading soft drinks in the USA such as Coca-Cola and Pepsi (Payton 2017). But this kind of creative neologising is not especially frequent in ordinary linguistic interaction between language users, and even less frequently do any innovative neologisms spread across the speaker network, leading to language change.

The individual's neoanalysis is, by definition, not conventional: it is associated only with the first time a speaker makes an *un*conventional association between a form and discourse function. However, such new associations may be replicated by individuals. A SP might consistently produce forms which he or she regularly associates with a given discourse function – but the H does not pick this up and transmit them to others; conversely, H may regularly make an inference that form F is associated with discourse function D, given the context of use, even if this is not something that SP intended, but this too may remain as part of an idiolect, if such inferences are not made by others in a social network. Such replications in an individual may be considered reanalyses. (The *re-* prefix is intended to suggest iterativity; the *neo-* prefix is intended to suggest novelty.) Such reanalyses are consequences of the original neoanalysis, but are still properties of

one individual language user, i.e. they are recurrent patterns in idiolects (Traugott and Trousdale 2019).

Linguistic change may be seen as the conventionalisation of reanalysis. It is the point at which both SP and H agree on and come to share a new association between form and meaning in a construction. The extent of the spread of the change is the extent to which interactions between SP and H involve the sharing of the reanalysed expressions: in the course of change, an increasing number of language users come to share linguistic knowledge of stored, automated units. This knowledge is itself dynamic: it "is not autonomous, abstract, and stative, but is instead continuously refreshed and reorganized under the influence of communicative events in social situations" (Schmid 2017: 3)

### 2.3 Bringing together synchrony and diachrony

In §§2.1-2, I discussed psycholinguistic and historical linguistic perspectives on interactivity between speakers and hearers, and how this may lead to the conventionalization of creative acts. Here, I briefly explore some parallels between the two more closely.

First, there appears to be a link between neoanalysis and interactive alignment. At the point at which innovative constructs are produced and processed, the SP and H appear to share a common code, but in fact there is no parity of representations (Garrod and Pickering 2013: 49). Instead, there is rather a misreading of minds; this occurs through alignment across the symbolic link that combines form and meaning. Second, there is a relationship between reanalysis and the concept of automaticity. Automaticity from the perspective of the psycholinguistics of dialogue is the entrenchment of conversational routines; reanalysis from a historical perspective is the entrenchment of constructions in the idiolect. But since such patterns are typically executed in interaction, the distinction between them is minimalized. An interesting point of comparison here is the place of routinization in certain kinds of written language (which is often taken as the source of evidence for much work in historical linguistics, and which is often not transactional). Thirdly, there is the question of the benefits of a constructional approach to language in both linguistic interaction and language change.

Bybee (2006) has foregrounded the importance of chunking in language, and particularly in language change. These chunks can be atomic (phonologically fully specified, with no 'slots') or schematic (phonologically underspecified), and may encode a combination of procedural and 'contentful' meaning (see the discussion in Traugott and Trousdale (2013)). Garrod and Pickering (2013) also recognize the use of chunks in dialogue, and their importance in processing and production.

## 3 Perspectives on creativity in music

As is the case with language, there is much debate in musicology about what it actually means to be musically creative (Jordanous and Keller 2012). It has been suggested that musical creativity is best understood like a Wittgenstein game (Wittgenstein 1953), i.e. in terms of family resemblance, and is subtle in ways we might not expect. A particularly interesting perspective on creativity in music makes a distinction between performance creativity and product creativity. The former is characterised by the kind of creativity we observe in acts of musical improvisation, while the latter is characterized by the kind of creativity we observe in a musical score (i.e. an artefact which codifies a creative act, cf. Sawyer (2000)).

That improvisation should count as a clear example of musical creativity would seem to be beyond doubt. However, as we have seen in the case of dialogue in language, spontaneous production of music is not a free-for-all, but instead involves the use and reuse of established patterns: "improvisation always occurs within a structure, and all improvisers draw on ready-mades - short motifs or clichés – as they create their novel performances" (Sawyer 2000: 157). These short motifs do not have an exact parallel in linguistic constructions, as they are not pairings of form and conventional meaning; but they share some of properties of constructions as fixed units of structure, which have the capacity for reuse. Such fixed units characterise certain aspects of improvisation, especially with regard to the reuse of existing materials. This reuse may be 'idiolectal', i.e. the structures may be used by an individual improviser, but much improvisation involves the sharing of structure, such that an improvisational performance involves reuse of motifs across musicians. It is this property of musical improvisation that leads

Sawyer to write of the "dialogic nature of interaction between coperformers" (Sawyer 1992: 255), and regularly rely on some degree of imitation on the part of improvising musicians. Imitation is seen as "a complex and ongoing alignment of observation in the model with action in the world" (Ingold and Hallam 2007: 5), in which specific contexts of use may give rise to some alteration in the structure of the short motifs that characterise improvisation. There are therefore parallels between the replication of motifs and their slight modification in music, and the place of full and partial sanction in language (Langacker 1987)[3]: in direct replication and full sanction, musical improvisers and language users rely on a set of stock expressions that are adopted without modification; by contrast, when musicians realign aspects of an erstwhile fixed motif, they behave in a way that parallels language users who creatively extend particular expressions in ways that fit the context. This kind of musical reuse is most evident in cover versions of codified (i.e. scored) instances of musical creativity.

Not all musical improvisers have the same degree of creativity. As Torrance and Schumann (2018) have observed, there is a series of differences between novice and seasoned jazz improvisers. For example, novice improvisers have a tendency to follow a collection of improvisational routines, which are more or less consciously constructed; by contrast, an expert soloist is more likely to invoke a fluent set of notes, with no detected awareness during execution about how the component features are selected or fit together. Torrance and Schumann (2018) identify the former as 'conservative' and the latter as 'radical' in terms of their improvisation. From the perspective of language it is clear that language users are typically closer to conservative rather than to radical jazz improvisers. Studies of language change have highlighted ways in which the extension of a category is achieved in a fairly conservative way, through a set of micro-steps. For instance, the development of the quantifier *a bunch of* in English (Shao, Cai and Trousdale 2019) involves a series of small-scale realignments in the shift from a partitive function (*a bunch of carrots*) to a quantifier (*a bunch of students*) during the late Modern English period. These realignments involve morphosyntactic properties (in agreement, for instance) on the form side of the construction, and semantic-pragmatic properties

[3] An important caveat here concerns the place of meaning in sanction; the absence of musical semantics (see section 4 below) means that the parallel between sanction in language and replication in music is only partial and restricted to form.

(where collocations of *a bunch of* with nouns such as *lies* and *nonsense* cannot be understood as involving a set of items that grow naturally or are bundled together, cf. *a bunch of flowers*). Furthermore, the incremental nature of the change is observable in the association of *a bunch of* with other binominal expressions (such as [*a {lot/bit/jot …} of* N]) in which a shift from partitive to quantifier function has also been demonstrated (see the discussion in Traugott and Trousdale 2013). Crucially, in each case the change proceeds in micro-steps (Traugott and Trousdale 2019), in which small alterations occur at various constructional levels.

To what extent are we able to observe similar small alterations at different musical levels? In order to answer this question, I present a very small case study which regards musical idioms in a way similar to that of the analysis of linguistic constructions. Specifically, I suggest that such musical structures:

a. are analyzable, but can be accessed holistically. In other words, the units may have some internal structure that musicians are able to manipulate, but they may be conceived of as cognitive routines
b. involve associations across harmonic, melodic, rhythmic dimensions. This is a central property of linguistic constructions, which have identifiable formal (e.g. phonological or syntactic) or functional (e.g. semantic or pragmatic) properties, but which are nevertheless associated via a conventional symbolic link.

### 3.1 A brief case study: *Mack the Knife*

In this section, I present the results of a very small corpus study of a number of recordings of the song *Mack the Knife*. This song is an adaptation of another piece of music (*Die Moritat von Mackie Messer*) which appears in *Die Dreigroschenoper* (in English, *The Threepenny Opera*), a composition for which the music was provided by Kurt Weill and the lyrics by Bertolt Brecht, first recorded in 1930. The corpus consists of thirteen versions (recorded between 1956 and 2015) of the song *Mack the Knife* and five versions (recorded between 1930 and 2014) of *Mackie Messer*. I focus on two different musical dimensions: (i) rhythm and (ii) harmony (including modulation).

### 3.1.1 Rhythm

A significant difference between the original *Mackie Messer* and the *Mack the Knife* version lies in the rhythmic structure of the piece. The variation in rhythmic structure is illustrated in Figure 1.

[Figure 1 about here.]

The original Weill version (as illustrated in [A] of Figure 1) rhythmically accentuates the first and third beats of each bar, a conventional approach to the structure of a piece written in common time. By contrast, contemporary versions of *Mack the Knife* typically have a 'swung' rhythm, in which the third beat of a common time rhythm is pre-empted, and as a result, the first note lasts not for a minim (two beats in common time), but for a dotted crotchet (one and a half beats), with the second note of the bar coming before the third beat. This is represented in [C] of Figure 1. The two rhythmical variants represent the prototypes for *Mackie Messer* and *Mack the Knife* respectively. However, there are also performances which involve some hybrid version (such as that represented by variant [B]): this does not have the swung rhythm of variant [C], but the first bar is also different from variant [A], involving two crotchets, rather than a dotted crotchet and a quaver. Most performances of *Mackie Messer* follow the rhythm of variant [A] or [B]; while most contemporary versions of *Mack the Knife* follow variant [C]. This is illustrated in Figures 2 and 3 respectively, which chart the proportion of the different rhythmic variants in performances of each of the versions over time.[4]

[Figures 2 and 3 about here]

Figure 2 suggests that *Mackie Messer* performances tend to avoid swung rhythm variants, even in recent recordings. Thus there is greater fidelity to the Weill score over time. By contrast, with the *Mack the Knife* recordings, one of the early instances uses

[4] While all five of the *Mackie Messer* recordings are analysed for this part of the study, only a sample (6 out of 13) of the *Mack the Knife* recordings are, as this suffices to illustrate the critical similarities and differences.

rhythmical patterns associated with the Weill original (even when using the English lyrics, as opposed to the German lyrics of the original), while later instances almost exclusively use the swung rhythm variant. So while early performances of *Mack the Knife* may involve more over blending between the original and the anglicized version, more recent performances show a more uniform and more distinct rhythmical signature. The shift from A to C as the conventional rhythm of the two variants does not seem to involve a saltation, however.

### 3.1.2 Modulation

Modulation involves variation in the tonality of a piece of music. In music of the classical period, for instance, modulation was a common practice which allowed a composer to develop certain thematic material. Composers have the capacity to exploit the 'underspecification' of a given chord in relation to a particular harmonic progression. For instance, in the key of C major, the chord of G major is the dominant chord (associated with the fifth note of the scale in the key of C). But it is simultaneously the tonic chord in the key of G major, the subdominant in the key of D major, and so on, allowing the composer to choose between a variety of different harmonic directions. This underspecification can be exploited to significant aesthetic effects. A standard example can be found at the beginning of Chopin's op. 28, no. 20, a piano prelude in C minor. The second bar begins with an A*b* major chord; since A*b* major is the submediant of C minor, but the tonic of A*b* major, the chord serves as a pivot to allow modulation from C minor to A*b* major in the second bar of the piece. Some instances of modulation are more complex and intriguing. For instance, following the establishment of a clear tonality in the opening bars of Beethoven's Symphony No. 3 in E*b* major (op. 55, 'Eroica'), the cello melody moves from the notes of an arpeggiated Eb major chord to a C# in the seventh bar. This suggests two potential developments: by treating the C# as enharmonically equivalent to D*b*, the modulation appears to be more conventional, from tonic (E*b*) to subdominant (A*b*); by contrast, the C# could indicate a much less conventional modulation to the mediant minor, i.e. G minor. Patterns of modulation can therefore also be a further means of musical creativity (see further White (2012)).

In the case of *Mackie Messer* and *Mack the Knife*, we once again witness a difference in patterns of modulation between the original and the adaptation. The original *Mackie Messer* involves no modulation at all – the song does not involve a key change as such. In *Mack the Knife*, by contrast, modulation is variable. Some versions (e.g. by Louis Armstrong) do not involve modulation, but others do (e.g. those by Bobby Darin, and by later versions that echo the Darin exemplar). However, the modulation does not involve a pivot chord (i.e. one which has a dual function in both the pre-modulation and post-modulation keys), on which see further section 4 below. Instead, the tonality is raised by a semitone (a half-step modulation) at the start of subsequent verses. This type of modulation is informally referred to as the "truck driver's gear shift" and often disparaged as a rather clumsy way of changing the tonality of a piece. It is very common at or toward the end of popular music songs (e.g. *Crazy, crazy nights* (1987) by Kiss, and *I will always love you* (1992) by Whitney Houston), but a similar type of modulation has a much longer history and has often been used very creatively in terms of the harmonic structure of a piece. For instance, in the final movement of Beethoven's Symphony No. 8 in F major (op. 93), there is a rapid but regular modulation to F# minor (a harmonically remote key given the F major tonality of the opening of the movement, but hinted at by the discordant and fortissimo F# during the otherwise pianissimo opening bars) and then a surprising half-step modulation at bar 392 back to F major.

## 4 Some creativity parallels between music and language

In this section, I explore in more detail some of the creativity parallels between music and language, using in part the data discussed in §3.1 above, couched within a constructional approach to language.

The first aspect of creativity relates to situations where properties of smaller units are reshaped by virtue of their appearance within a larger unit. In language, this can be exemplified by coercion. Coercion may involve the mismatch between the semantics of a unit and the semantics of a larger construction in which the unit appears. Within the construction grammar literature, coercion of a verb into a particular argument structure construction will extend the scope of that construction in some way (Goldberg 1995).

For instance, the relatively recent addition of verbs like *whistle* in the *way*-construction (as in [1]) have led to the meaning of the *way*-construction being extended from the means (in [2]) or manner (in [3]) of path creation to a marking of incidental activity:

[1] He whistled his way through the meeting
[2] He elbowed his way through the crowd
[3] He waltzed his way along the corridor

Here some degree of mismatch is resolved by the construction imposing some of its semantics on the smaller unit (Francis and Michaelis 2004), and cases of coercion, at least in their initial uses, typically signal a degree of creativity on the part of the language user. Coercion can lead to change if the imposition becomes conventionalized.

Unlike language, we cannot speak of musical coercion, in that coercion crucially involves semantics, particularly the imposition of some sort of conventional meaning of a larger structure on a smaller one. A fundamental difference between music and language lies in the absence of musical semantics (Jackendoff 2009). But it is clear that versions of existing musical structures can take on properties of particular genres. The distinctive rhythmical structure of *Mack the Knife* as compared to *Mackie Messer* is a result of the new version inheriting structural properties of the swing genre, particularly in terms of syncopation.

The second aspect of creativity concerns the relation between *apo koinou* constructions in language and pivot chords in musical modulations[5]. An example of an *apo koinou* construction is given below in [4] (from the Switchboard corpus, as reported by Ross-Hagebaum 2004: 403):

[4] That's what I was about to say is that everyone needs to be tested

In [4], the sequence *what I was about to say* appears to be simultaneously the complement of the first *be* and the subject of the second. Ross-Hagebaum (2004) refers to such patterns as *That's X is Y* constructions, and through a careful analysis of the discourse context

[5] I am grateful to Martin Hilpert (personal communication) for discussion relating to this topic.

identifies one of the functions of the constructions as being to specify a particular referent from a set that has been mentioned previously in the discourse. While the construction is typically associated with informal, even non-standard, English, it is clearly creative and serves a particular information-structuring function.

In music, we see a structurally similar pattern in the use of pivot chords in harmonic progressions as discussed in section 3 above. In such sequences, a given chord appears to be simultaneously the end of the harmonic structure of one sequence, and the beginning of a harmonic structure in another sequence. While this method of modulation may be a 'structuring' device in terms of the harmonic progression of the piece as a whole, again the parallels with language cannot be drawn too strongly, given the issues of musical semantics noted above. As noted in the discussion of *Mack the Knife*, pivot chords are not the only means of musical modulation, and it is possible to develop the harmonic structure of the piece using the kind of half-step modulation that typifies many of the versions of *Mack the Knife*: this does not involve a structure that has the potential for more than one parse. In language, many cases of reanalysis in change rely on the possibility of a sequence having more than one parse (and therefore potentially representing two different grammatical structures). Thus in [5], the sequence *as long as* may mean 'for the same amount of time as' or may mean 'if and only if', i.e. a conditional perfection sense:

[5] I'll stay as long as you do

But ambiguity is not a prerequisite for reanalysis (Detges and Waltereit 2002), just as pivot chords are not prerequisites for modulation.

## 5 Conclusions

This brief overview of some of the issues surrounding creativity in language and music has attempted to point out the following:

(a) where potential overlap between creativity in language and music may occur
(b) where the limitations for the comparisons lie.

It is intriguing to see some of the comments on creativity made by musicologists and how clearly they relate to aspects of creativity in language. For instance, Sawyer (1992: 258) suggests that "as with other scientific and artistic fields, creativity consists of innovation within constraints". This strikes me as being as applicable to language as to jazz. The nature of the constraints will differ, of course, but the essential issue seems to me to be that creativity may involve micro-steps, and may be bound by the overarching properties of the system in which language and music operate.

A particularly promising line of enquiry for future work concerns dialogue in language and interactivity in music, in terms of creativity. Garrod and Pickering (2013) make observations about routines and conversational flow in dialogue which seem to have intriguing parallels with some of the work on interaction in jazz improvisation (Torrance and Schumann 2018). Garrod and Pickering (2013) also make some allusions to how interactive alignment may be linked to processes of language change. It would be interesting to see if similar process of alignment could lead to the sedimentation of particular musical routines in jazz, and to the development of new conventions in a way that parallels (but will not be identical to) aspects of language change.

This last point is critical. While the parallels are intriguing, the differences between language and music in terms of creativity must also be recognized. As new jazz improvisers develop their skills, certain past masters may function as role models; there is no direct parallel for naturally occurring language. Furthermore, musical and linguistic exemplars are not identical and the degree of conscious reference to previous exemplars varies, and certain musical cultures rely more heavily on product creativity than others, and more so than linguistic communities.[6]

Nevertheless, exploring what links music and language in terms of creativity is an intriguing topic. It appears that the (absence of) musical semantics that parallels linguistic semantics may limit some but not all aspects of comparison. As a result, a focus on some of

[6] A reviewer of an earlier version of this article makes the point that there are important methodological differences in using a corpus of recorded music and the kind of corpus typically used for analysis of language change. Importantly, until recently it has been difficult to establish variation at the level of the individual in a historical linguistic corpus (but see for example the EMMA corpus [https://www.uantwerpen.be/en/projects/mind-bending-grammars/emma-corpus/] for a new development in this area).

the formal properties (such as the development of particular rhythmic patterns, or conventions associated with different means of harmonic progression) may be revealing. Furthermore, the nature of linguistic and musical creativity is likely to be better understood the more we explore as diverse a range of languages and musical cultures as possible.

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Figure 1. Rhythmic variants in the opening bars of *Mack the Knife*.

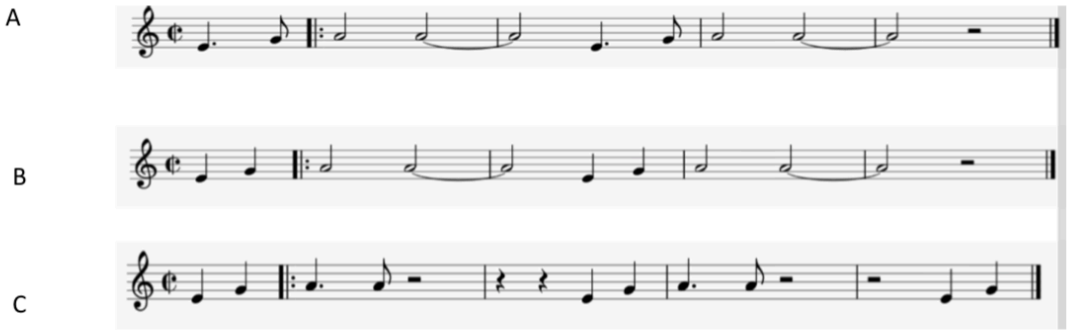

Figure 2 Rhythmic variation in five performances of *Mackie Messer* over time

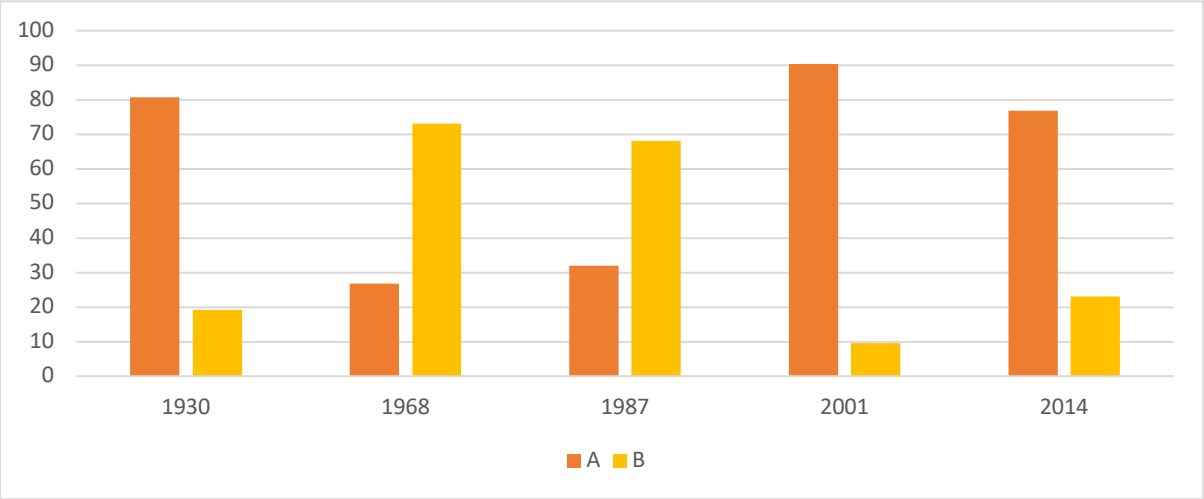

Figure 3 Rhythmic variation in six performances of *Mack the Knife* over time